IAF – 92 – 0477

WORLD SPACE CONGRESS 1992

The Influence of Motivation at "hands on" Programs.

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43rd CONGRESS OF THE INTERNATIONAL ASTRONAUTICAL FEDERATION
August 28-September 5, 1992/Washington, DC

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The Influence of Motivation at "hands on" Programs.

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Abstract:

Goal of any human education is the "grown up" with good education. Without participation of the learning humans in the educational process, this goal is not reachable.

The paper examines the different reasons to learn. It is shown, that the most important reason is the motivation to reach a self proposed goal.

There is a theoretical view of the education, accompanying the traditional way of practical education of the historic Europe. The relation between the motivation to do a job and the responsibility for this job is well known. Therefore since the middle of the 19th century the topics of education deal with motivation to learn and with teaching responsibility.

The personal experience of failing in the approach to bring an own product, made with hard work, to right operation, if there is a failure in obeying the physical rules in this product, is one of the most powerful motivations to learn. Learning from your faults has to be taught by education. "Hands on" education is one of the best methods to reach this goal.

Introduction

Mankind is involved in a rapid development process. The single human beings do not watch this changes or at least do not intend to reflect upon the reasons of this events. The development of the individual being is overlaid by the development of the society. This paper has the intention, to demonstrate and to analyze the effective acting forces and the mechanisms in the le- arning process. If we will take influence insides of this process and modify the goals, we have to understand the influences and psychical mechanisms. The same case is needed if we want to suppress unliked effects.

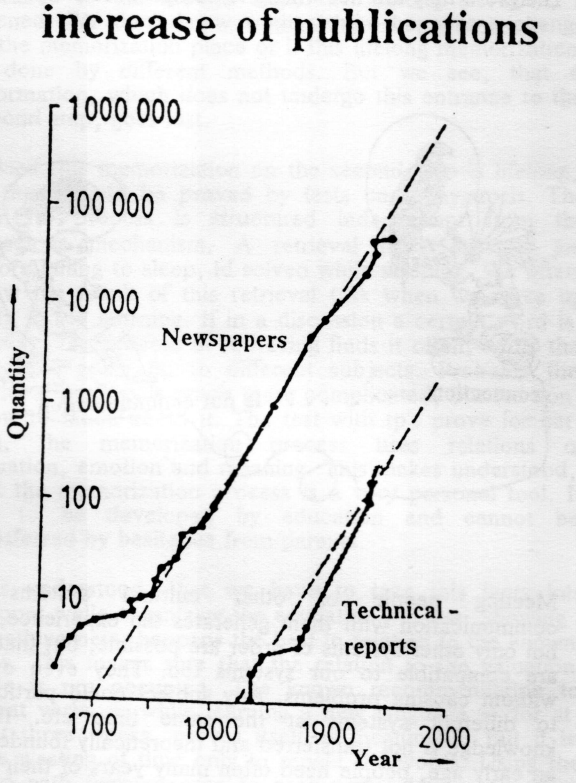
First we will try to understand the different methods of learning, understand and valuate them. The scale of values - used from us meanwhile - has to be defined and to be pointed out it's influences on different levels of this scale. Than we have to examine the different reasons for learning ad to put them into the wright order. Finally the consequences for education will be deducted from this results.

Historic relations.

It is independent, how big the stand of knowledge and experience of father and mother in the moment of pro- creation of the child were - in this moment the hereditary disposition is mixed irrevocably - the child's hereditary disposition is an structural empty vessel to be filled with knowledge and experience in a learning process. Being a human is inseparably connected to the need for reproducing the educational and learning process from the origin.

Observing the demonstrable history of educating the youth, the time for purposive teaching of the youth is the minority. For a long time, the simple imitation of the grown up's behavior together with the knowledge included in fairy tales and stories of the own social group, was sufficient to get all needed knowledge to become a valuable member of the group. In the early middle ages planed education of skilled young people in the monasteries became the way of education because the word has become more complicated.

Later the scholar type of classroom education became more and more the only accepted way for transferring knowledge. Nobody watched the alarm signs. If you imagine a healthy five to seven years old child, you never have the chance to respond all questions, the child could ask. Four years later, after transferring the child to the teachers in school, it does not ask many questions. The natural motivation of learning went lost. It had learned obedience and more other important things, but the price

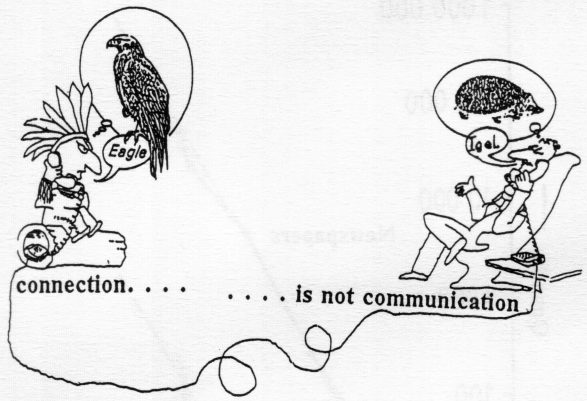


became a increase of frustration to learn. This must not be so.

It is understood that in our times (knowledge explosion) additional technics to train the young people is necessary. It should be from interest, if there is a accord between the modern and the traditional way of learning. Even if we know, that there is no direct dependence between learning and genes - related to the in- survisionable quantity of hereditary dispositions, nobody could say, that there is no support of the one or the other traditional technic. We should leave all possibilities open and select ways, which are in no contradiction to traditional ways, if possible.

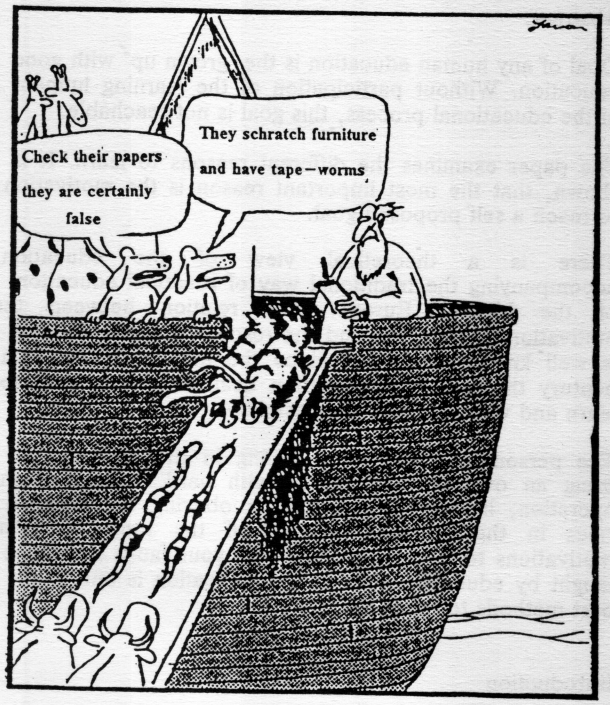
Human beings are helpless while judging without order and standards of valuation. If it becomes possible to tag the facts and to sort them into drawers, we become feeling comfortable. If we have to clear up a chaotic situation, we start with installing an order. In the same situation it is off course possible to put different patterns of order over the facts without blaming them wrong. This world is – as we know – no simple singular thing but a polar system with poles who normally exclude themselves. Our standpoint is more occasionally anywhere between this poles. If different people generate order systems this systems will therefore differ if there was no prior harmonizing. The traditional schools should at least have trained everybody to know this. The first task of communication should be therefore the harmonization of the standpoints.

Inside the same cultural system this is normally no problem, because the mechanisms of traditional education generate people with similar systems of order and standards of valuation. It takes some years of experience to understand that there are possibly different systems of order existent besides each other in this world. At the beginning anybody has only an own system and no knowledge that the rest of the world in not pure chaos. Therefore he fights against anybody who seems to shift him from an order system to the chaos. This explains the observable fanatics of young people in persecuting goals. They fight against sliding into the chaos. Therefore they are not willing to compromises.



Meeting people of other cultural systems and communication with them generates the experience, that not only other systems of order are possible, but that they are compatible to our systems too. They even overlap without causing problems. Any subject could participate to different systems at the same time etc. If this knowledge is not transferred and theoretically founded in an early age, people need often many years of their lifes time to become enough tolerant to be citizens of the one world. Here we understand what crime is done by dictators and leaders of fanatic sects to let swear their young followers on unilevel simple world models. The advantage for this leaders is easily visible, but this makes them unable to participate in the development process of this world and is the reason for immense losses for mankind (f.e. the cultural revolution in china).

Order systems are at all times also standards of values. The values of the single subjects are – for the individuals – in all cases between the one and the other value of subjects which are less or more worth to the own valuation. Growing up is not at least a process to organize the world into a chain of values. This saves time, because it is not necessary in all cases to decide the own standpoint. The decision finding process is often painful and normally takes time. With such preorganised view of the world (prejudices) one can use known patterns of behavior. Any totally new has to be valuated and put in relation to this order.



PREJUDICES

Prejudices have a bad reputation. but we should remember, that prejudices is the nature's tool to solve the problem of children. Children are at the beginning empty vessels of knowledge. Life forces from the beginning judgement in valuation situation of behavior. The knowledge of children normally does not allow the judgements by taking in account all necessary points of view. In this case nature has given a system of judgement to the child, which excludes the personal judgement in all cases, where the judgement of educators could be overtaken, the production of prejudices.

This prejudices to replace by own generated judgements – to be used in the same mode – is one contents and goal of the educational process. On the second step, young people have to understand, that replacing overtaken prejudices by the results of own judgements is only the first step of generating an own personality. This handmade judgements become very fast new prejudices, because the world changes continuously. This to transfer is the second task and goal of education. Under this point of view, all people with prejudices prove themselves as to low educated to survive in the dynamic world, without the help of others.

The generation of new relations in the chain of order and values could mean throwing away proved old technics, because the better is always the enemy of the good. With growing age and with more fixed own standpoint – which is demonstrated by the reached position in the society too – people do not like to modify meanings and valuations. This is easily to understand because their demonstrated meaning is known to others and they count on it, using it as prejudices. This is one of the sources of

the social influence of higher situated persons in the society. The proverb: "don't trouble me with facts, I have a fixed meaning" demonstrates this exceptionally. Unfortunately this mode of "stiffness by the age" is watched at leading scientists too, if they refuse even to discuss new scientific meanings, which are in contradiction to the fixed stand of knowledge in the specific science (Galilee effect).

This wonders a independent observer, because we should have learned already at school, that truth has one wonderful effect. It remains true and free from contradictions even under curious questions, as long as we do not include artificial limits into the system. Nobody has to fear a discussion over facts. Either the result is, that the new idea prove themselves as wrong or you cannot prove the contents of truth in the idea. In the first situation there is no need for further discussion. If there is no proving possible, this could mean, that it is true or we do not understand enough to prove the question as it is. This could be the beginning of understanding a new truth and nobody should trouble this process by refusing the discussion. All scientists should be proud to help new truth become known. So there should be enough reasons for discussion of the facts.

Why don't you draw something orderly, as your father does?

It is the most interesting task of science, to generate knowledge. This can never happen inside a fixed knowledge system because the organizing of the facts in an order is the profession of scientists all the time. But we should expect an approach to new knowledge at the limits of the known. But it remains true, as long as the new facts are not proven as true, nobody needs to hold them as true, they are only possible – not more. But proving them as wrong or true should be an interesting task to generate new knowledge for anybody, especially scientists.

Ways of learning.

Before we could generate new knowledge, it is needed to learn the stand of the art. Learning means taking new facts into account, understanding their conditions and relations to the known facts and valuating them, to put them into this own chain of values. As result the knowledge chain will be enlarged. Knowledge without relation to the own order of values is not handible. You cannot use such knowledge and you could not even retrieve the facts of an object from your memory by using keywords others as the name of the object.

This relations are handled by the language automatically. We do not know, how the brain organizes this retrieval process, but we know the fact that there is a strong relation between the order and the understanding of relations. Language organizes this relations independent from the order of memorization. We can learn the facts in chaotic order and the storage is done without problems so that we retrieve always dependent and relative facts without watchable delay even if the time of their memorization is very distant from each other. This works even if we stored the first impression, which is retrieved by association, at a time where we did not understand the relations to our nowadays questions.

We could understand a little bit about the memorization and retrieval process, if we make experiments with test persons (tp). It seems to be so, that words with an inner relation of meaning are store together at the same place in memory. The tp's memorize together words which have an inner relation on behalf of the personal system of values. If the tp reminds something good, all the rest will be in good mode. The same happens with negative emotional relations. This makes sense to the recommendation "think positive".

The process of memorization and retrieval has to happen at least in two different steps. In storing the information there has to be an intermediate step which is time dependent. It lasts from some hours to some weeks. If this prememorized event is related in this step to other relevant informations or repeated several times, the entrance to the second step, the lifelong storage , is opened. We don't know wether there happens a change of the memorization place or if this lifelong memorization is done by different methods. But we see, that all information, which does not undergo this entrance to the second step, goes lost.

Indeed this memorization on the second step is lifelong, as there could be proved by tests under hypnosis. The retrieval process is structured independent from the conscious mechanism. A retrieval task, ordered just before falling to sleep, id solved while sleeping. We often know the result of this retrieval task when we wake up early in the morning. If in a discussion a certain word is missing, the process of retrieving finds it often, while the talks are going on to different subjects. Probably the retrieval process is much more complicated, but we don't know to much about it. The test with tp's prove for certain, the memorization process uses relations of valuation, emotion and meaning. This makes understood, that the memorization process is a very personal tool. It has to be developed by education and cannot be transferred by hesitance from parents.

It is understood, that we have to take this facts into account while organizing the education process. Showing something new, happens the best in relation to the known facts. This makes sure that the relation to the valuation scale is pre occupied. The known recommendation to repeat verbs – while learning a new language – for at least three weeks, proves itself as meaningful. But it is pure wasting of time only to repeat the words. Using the word with forming case to case new relations to other facts does the same job, but it helps to organize the inner valuation and order process. Here the phantasy of educators is asked, to find new methods of learning facts without blaming the pupils by stupidity and frustration.

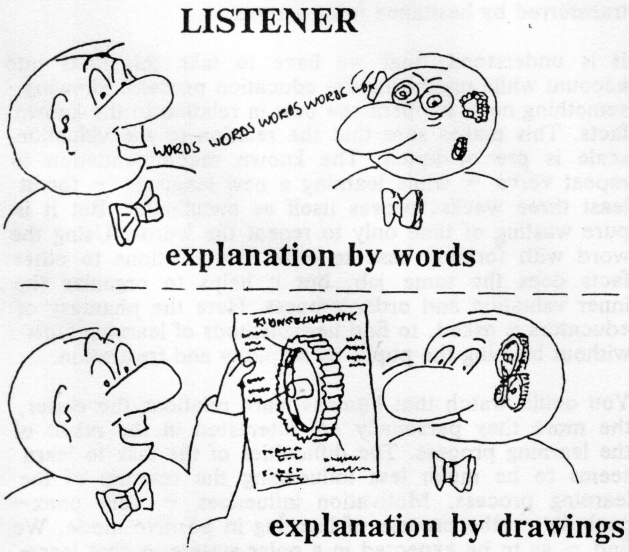
You could watch that humans learn relations the easier, the more they personally are interested in the result of the learning process. The difficulties of the task to learn seems to be much less influencing the severity of the learning process. Motivation influences – very unexpectedly – the process of learning in positive mode. We find – as to be expected in a polar system – that lear-

ning from the position to avoid punishment, is used too in the same mode. But it cold be easily shown, that the results of the learning process ouster demand of punishment is worse than under motivation. If the punishment looses it's influence the results of the learning process loose their actuality and go lost ore become hidden. The last effect makes understood, that there is associative storing in the brain. The association to the bad condition makes the effect unaccessible on good conditions. Even this can be proven under hypnosis. It seems to be so, that the forgetting of the bad conditions of learning influences the forgetting of the learning stuff too. This relation between learning process and emotions forth the educator to use only positive methods under best conditions for the learning, to reach best effectiveness.

The observation, that kids imitate and take the information to be taught, easier from persons they trust and estimate positively, lyes on the same level. This leads us to another aspect of learning. The genuine process of learning happens by imitating parents or other members of the own group. This means the action, doing by imitating, is important. This explains why, "hands on" education is so important. We will later talk about this.

Another aspect of learning are the different methods of different individuals, to take the information. The one learns better by listening, the other by taking images on his optical path. This influences the speed of the information process. The idetic, the human to take images easier than spoken words, has a much faster input, than the sequentially taking listener. An image says more than one thousand words, says the proverb. The idetic saves the valuation and organizing process while taking the structure of the information with the image. This has advantages and disadvantages.

The fast processing of information saves time, but the receiver needs more effort to understand faults and errors done by the transmitter. The image seems to be structurally ok, therefore he has not doubt on details. The listener organizes the structural relations new, while taking the information. He easily understands structural contradictions and missing relations, just in the moment, while he takes the information. On the other hand, he often misses the structural message, the transmitter wants to give to him, because he is lost in the fight with the incompetence and the estimated contradictions of parts of the information. For the idetic this is no problem, because he always knows about the incompleteness of details. He is used to supplement details out of his knowledge of the structures. For the idetic the whole transfer of images is a dynamic process. For the listener, the need for orientation gives him only the help of his own retrieved image of the message transferred to him. Emotions in their transferring process and formal besides effects as voice timbre, loudness and others, have much more meaning for him than for the idetic. Therefore it takes much more time to come to the same view of an unknown subject.



The idetic has to learn during the educational process, to understand from questions of his talking partner, wether he gets his message, on the same structural level than he is used to do, or wether he needs to go more into details with higher quality of the speech, because his partner does not wait till to another scan of the reality to judge about the facts. Her does it immediately while talking. The listener has to learn in the same process to understand from the choice of images and patterns, wether his partner will use the – for him naturally known – detailed information process, or wether he scans roughly images and expects that judgement is done later after transfer of the major parts of the facts.

We have to learn tolerance in talking with partners of different methods of the communication process. There is finally no quality difference between the one and the other process, if the depth of the informative transfer process is the same. The idetic does not need to go to much into detail, if this is not needed. But he risks misunderstanding if his partner does not have the same level of information and knowledge background. He never gets notes of this misunderstandings, if the partner does not talk about it. The listener risks to take much more time in inefficient details, if there is no deep message in the communication process. He has not the possibility to use plausibility technics, while his partner ps jumping between images and chains of words. But he gets faster to critical judging about facts.

We will save discussion about the so called "mystic aspects" of learning. We understand this better, if we remember that the vocabulary book, put under the pillow, would do the same job, if we found another way to remind the words to be learned. Normally a pillow without a book under it, is more soft than with a book. Just this gives reasons to remind the learning task. Not the place of the book but the action of reminding actualizes the learning process.

Learning is another way of training for unknown situations. We have fear about the unknown. By training the situation in the learning process, the unknown looses it's frightening habits. Meeting an unknown situation, forces the human to understand and than the information valuation process goes on, as told above. Training saves this time of organizing the surrounding world under new aspects. Normally new patterns of behavior will be learned, if there is no relation of the actual situation to

the known patterns. As humans are lazy, they first try to subsumize all watched effects under known patterns. This often is the reason for misunderstandings. The search for known patterns takes time. Enemies try to use this "surprise effect" to gain advantages of an untrained foe. Training situations prepare therefore to handle life in a much better way.

Education in a family happens by gambling situations. Most of the educational processes happen inside the family. This explains the advantages of imitation of this familiar situation while the educational process is happening. It explains on the other hand the role of the educator as model. Good and bad attributes are taken without questioning her value, if the model uses them. Learning while playing is the most natural way of learning. Children of animals learn already using this methods. Handling the body functions, language, social behavior and communication is trained there. Behavior in situating rolls, reaction to unknown situations, methods of demonstration of situating dependances and standing for one's standpoint are trained here. The better this training is, the more chances has the later adult to handle the problems of life. We should take in account one very important possession of learning while gambling. The negative consequences of faults are less hurting than in reality. Loosing a house while playing monopoly has much less negative results, than loosing a house in life. While playing, the players could risk more relations on the limits of reality, than in life. So they could learn where the limits are and how the limits could be used in reality.

Later in the training for life's situations we use similar technics. We use simulators. Using a flight trainer gives the possibilities to the pilot of approaching the limits of stable flight situations, without risking a crash. The possibility of experience in critical situations is the advantage we win from those technics. We have to use th[illegible]ide the educational process. The trainee gets the experience of the system's behavior just before it happens. This gives him later the feeling for the needs in the critical situation. He than knows by personal experience: this is the point to do something and not to wait. If he waits the situation will force him to react instead of acting.

Learning means always the increase of order in the own brain. This means that any new information modifies the own position. Things who had become aimed in the past, lose their meaning. The response to new situations changes because there is less unknown and accompanying less "fear not to win" in the organizing process. There might be some unwanted besids-effects too. Some people refuse learning, because they fear the consequences and fear to be faced to new situations.

The inertia of this human system is large. The fear to fail, accompanying learning processes could cause severe psychosomatic maladies. Therefore it is very important, that educators limit the possibilities of fear, give possibilities of successful results to avoid frustration and train the trainees to handle their errors and faults. Nobody can win under all conditions. but this can be taught and trained. Under this point of view the examinations while studying become important. Making examinations free from fear and frustration, is one im-portant way to install lifelong learning processes on a voluntary base.

Technics and education.

The goal of any education should be: the influencing of human beings to change their base of judging and doing. This could happen only on a voluntary base. It could really also be done by force and by using the fear of the trainees. They learn to avoid worse conditions. The brain washing camps to influence war prisoners in Asia, have shown that it is possible to educate even against the will of the trainees. The result of a method is - as expected - a question of the right selection of the actions to reach the goal.

As we have seen from the last chapter, humans learn best, if they do it voluntarily to reach a self proposed goal. This situation is called motivation. So the question, how should I train my pupils to have the training results, should be modified to the question, what can I do to get my pupils so much interested in the goal, that they learn voluntarily. Who never had to respond to that question, cannot be a good educator. at lest no one with experience.

Even at schools with voluntary character, the participation to the courses is needed to get as result of the course, a certification or another document. Pupils visiting those schools have not the freedom to learn or not to learn. Not learning has severe results. To avoid these results, it is better to learn. If the teacher cold motivate the pupils to learn from their selves, the fun-damental educational task starts.

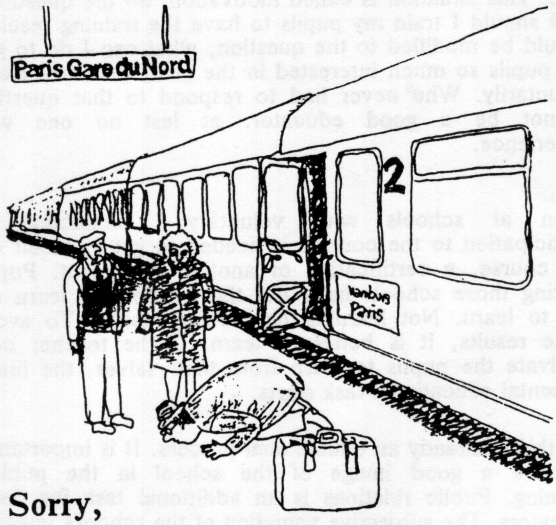
But this is already an educational process. It is important to have a good image of the school in the public meaning. Public relations is an additional task for the educators. The subjective valuation of the school's image is mostly in contradiction to the trends of fashion and the society. The famous image of the British noble schools of Oxford and Cambridge prove this. The old fashioned outfit of these schools, the good chances of there educated people and modern methods of teaching seem to be contradicting. This does not influence the positive image of this schools in the public opinion.

The preparation of the learning stuff is from fundamental influence to the results and the effectivity of teaching. In whatever technical method the information is transferred, with courses or in a traditional way by classroom teaching, it seems to be from no influence to the results. At least as long as the conviction of the pupils to want the result can be reached. From an far away standpoint all those educational systems differ most in relation to the effort, the teacher has to invest in preparing the lessons. Even there it seems to be so, that the influence of the education process of the teacher himself is more important than the used educational method. Some have just in those system which they choose difficulties to avoid the same difficulties under other conditions.

The personality of the educator becomes important with respect of the knowledge transfer. But learning is knowledge transfer. An educator, who is unable to express his own standpoint, who demonstrates the uncertainty in orientation, cannot transfer the truth to the pupils. But there are teachers who could even teach lies as true by convincing methods. The history of education under dictatorships is filled with examples of this mode. In a free society the educator has to transfer technics of plausibility tests, to discriminate the truth from the rest of informations. Using this, the pupils will help themselves to learn the right facts and relations. The teacher than has no more need to act as the lion's or tiger's master with relation to the misunderstanding.

Human beings which have no certain standpoint in the world, lack the needed attributes to educate others. The from those people educated, could take less responsible positions in life, because the quality of their educator limits the positions which later could be taken from the educated. Who will take the responsibility for limitations in the career of other's, by reason of lack of education? Education hat a high value to the society because this limits the progress. This is in contradiction to the social position of the educators in the same society. One of the reasons could be, that educators remind anybody to his

own educational time and off course to the own failures and frustrations during this time. Nobody wants to be reminded to own bad situations, at least those who became mighty. This is another reason to make the education friendly and to teach handling of errors and faults without frustration.



Sorry,

but Pope John was much more impressive

One of the proved technics of education – which is trained in thousands of familiar situations – is education by personal example. An educator who lives the rules he is talking of, anybody is willing to trust, that he is honest in his approach. He demonstrates that his contents of ideas and plans is not invain nor worthless. While being educated, many pupils made the experience that there will be given a lot of recommendations which are worthless, because visibly nobody follows to this recommendations, the less those who are talking about. The educational process should include situations in which the educator has opportunities to prove that he follows his own rules. This can be modified to a situation, in which the one demonstrates a situation and the others imitate the same. One of the first, to demonstrate is that the situation is practically usable is the educator to demonstrate it.

If the educational process is pure transfer of theoretical knowledge, those theories cannot be used. But a good education should contain cross-check and at least mental training to give the students possibilities to anchor the theoretical facts in their own order of values. Education is more a process of relating facts to each other, than a process of pure transfer of facts. In this case the training courses could be hidden in the course. The educational situation is easily organizable into a chain of games to play with each other. Under this circumstances the needed frequency of repetition of the new, can be reached without even understanding that this is a training course. Organizing the educational process in such joyful funny mode is a challenge to educators.

One of the proven educational technics is the cutting of big structures from the not surveyable big structures to small handy pieces, anybody could handle. The Latin proverb of Machiavelli, one politician: "divide et impera" which means cut to pieces and than rule over them, has not only the meaning, that the power of the pieces is smaller than the power of the community as a total, and therefore it easier to govern them. The ruling of small surveyable areas is easier because more people are willing to try, as they do not fear to fail. On the other hand, the very big quantities influence the people with no qualified self conscience, to try it, even if they are unable to fulfil the job.

One of the reasons is, that the possibilities to make faults are smaller, if there is not so much possibility to do something. So the frustration in failing is smaller. Again we see, that the fear from being frustrated influences human behavior. We have to train young people, how to handle faults and failures without frustration and how to gain positive results of negative events. F.e.: a failure is at least good for learning, what has to be avoided. etc.

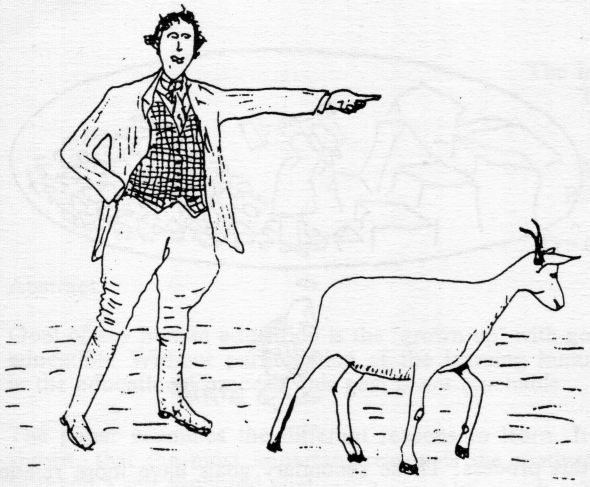
Teaching fault tolerance

The education has to transfer technics how to handle failures. Showing failures as bad, and blaming the pupil for doing faults, is bad experience from most people out of their own educational process. Off course nobody should be happy about faults. But failures have a fixed place in the process of learning. Without understanding this position, the learning process becomes ineffective. Nobody learns the limits of his doing, because all try to avoid coming into situations to make faults. This limits life's possibilities. If somebody does nothing, he will never make faults. All efforts of the trainee will be transferred to the situation of avoiding faults instead of handling the task. The goal of education – the human being able to handle and to master all possible life's situations – will never be reached if there is no knowledge of perfect failure handling.

This handling of failures has to be introduced on a very early age into the educational process. Children have normally a natural relation to failures. They know: if something fails, it has to be repeated until it fits. That's their natural experience of their educational process. As long as there is no social situation reached in which a failure could blame the man or woman, it is easy to learn handling failures without being blamed. The society gives higher social positions to people, from whom they expect to be able to master all situations. Demonstrating to be unable to handle own faults, blames in this case. So the meighty will try to hide their faults. In this case a lot of dependent problems follow out of this situation. The person to hide a fault, becomes blackmailing. etc.

Nobody likes to make faults. If anybody makes faults, there is the possibility that he even did not understand, that the fault is wrong. This shows a lack of understanding of the inner relations in the system, he is handling in. Faults are never isolated. They almost happen in relation to other effects and situations. So we have to understand failures as pointers to the unsolved parts of a problem. The other reason to make faults is, that the person who made the faults could be overloaded. Probably by being in the bad situation, to do a job without sufficient education for it, or simply by being to tired to watch all boundary conditioned of the situation. Therefor it is very importation to understand the reasons, why faults happen and to do something against this reasons. Anybody has to understand, that faults are not a reason to be offended and to retire to the sulk corner. Faults are the utmost reason for personal action to do something against the reasons. But how would you do something against a reason which is unknown?

One of the liked societies games is to find a person guilty of making the error and to isolate him as the only reason of the fault. All ancient religions solve the excluded problems to send a scapegoat into the desert, after having charged him with the sin of the society. This is the best demonstration to the young, that faults are a sin. Nobody does them etc. The result is extreme hypocrisy. And the other result is the loss of dynamic processes in such a society. As told above, the avoiding of situations in which faults can be made, limits life to the well known paths. As demonstrated above, this situation never gives the opportunity to do something new. So the development of such society stoops, it becomes static. But in biology all processes in which there is no development, are the beginning of dying.



send the scapegoat into the desert !!

Handling dynamic life, as needed to enlarge the society's possessions into the new age, needs going into critical situations. Making faults is inevitable under this condi-tions. In this situation making of faults shows where the boundaries are. The handling of these situations without being frustrated, is a very necessary tool, to master life. Educators have there their major task. People have to learn making the best of a situation. This includes finding the boundaries of the possibilities, but without frustrated actors.

Handling faults needs technics. Any person should train a certain game of questions and answers to analyze the situation:

1. Is the fault new, that means is the effect already known?

If no: why is it made again?
If yes: are there situations under which similar faults can be made?

2. What is the reason for the fault?

If lack of knowledge:
What can be done to shut the gap of knowledge?
Which similar or other faulty situations can be the result of this know-ledge gap?

If carelessness (or being diver-ted etc):
What is the reason for the carelessness?
Could this carelessness lead to other faults from the same reasons?
What can be done to avoid the same situation in the future?

3. Have there been early warnings, from which the faulty situation could have been understood before the fault happened?

If yes:
Which are this warnings?
Are they trainable for avoiding the situation?
What technics is needed for watching and avoiding?

If no:
Are there signals or other boundary events which could serve as those early war-nings?

4. Is my personal situation so, that I could continue my job without doing more failures under similar conditions?

The consequences of the response of that question have to be taken.

Parallel to this method of inner fault processing, there has to happen the external limitation of the following effects of the fault and to be corrected the faulty situa-tion. The best result of all this discussion of faulty situations is the installation of fault tolerant situations. This includes the introduction of structural redundancy into the system.

We could learn here from nature. There is no natural system in which the redundancy is so low, that one single fault could lead to catastrophes. f.e.: All signals in natural data processing are transferred on parallel lines at the same time. Cutting some lines never stoops the data processing totally. The system includes redundancy. You cold get personal experience with the amount of redundancy which usually is included in natural information processes, while watching a surgical operation at the open brain of a man, to remove a swelling.

The surgeon has the patient sitting on a chair in front of him. The patient is aware the situation, awake and reads a book ore something similar loud, to prove his brain is still working. The surgeon listens to the words of the patient to understand wether the brain functions as needed. Than the surgeon removes spoon after spoon of the patient's sick brain mass, controlling the remained function by listening to the words. Take into account that the brain is the natural "on board computer" of the living being and than think for a situation, under which you could remove parts of a man made computer without influencing it's function? Now you have understood what structural redundancy means. Nature has selected all systems to survive which are fault tolerant enough to withstand the changing troubles of real life. We have to learn from nature.

Using help aids.

The learning process has to include the use of help technics. Today knowledge stored in libraries and other places as databases etc. are available and their use is needed to master the world. The learning of facts from the past seems to be necessary, because it trains the brain. But the needed training does nor really take into account the facts themselves. Using dictionaries help to translate a foreign languages text if you know how to use the structures of the language and the use of dictionaries. Without knowledge of vocabulary you could help yourself. Without knowledge of the technics to handle the tools, the knowledge of all words of this language would be invain. You cold not use it.

Sources of Information

acess by:	dialogue	reading	electronic
	human beings	letters	databases
	museums	books	information bases
	archives	newspapers	knowledge bases

Man has to learn not only to use these external tools, containing knowledge and facts. They have to learn at first how they could describe their problem. Others cannot help, if they do not understand the problem. First an analysis of the problem is needed. Than the qualification of the problems is needed to understand, what help you need first. This could be very helpful under viewpoints of efficiency. Than knowledge about the gained help is needed, to know the quality of the help you could get from the different tools. The level and the quality of help from the different tools is different too, as you could easily understand, while taking mathematical information out of a newspaper or a mathematical libre. At least you have to learn how to use of modern technics as databases etc.

All those technics can be taught and trained. If the educational process ends with teaching only those tools, the educated could help himself in a dynamically chan-ging world. If there is the same effort used to learn only facts and all knowledge of facts, known today, is transferred but no technics of information transferring, this has to lead to problems in the near future because the world changes continuously.

The best help technics is the motivation, to grabber out from all situations all such which are needed, to reach your goal. A motivated will find it's way in spite of all problems and disgusting situations. Activating the interest of the learning and continuous training with subjects of his interest as done by competitions and contests, encourages to compare and to compete with others. The subjects of learning have to be followed with so much motivation, that they need no teaching process by classroom transfer. Pupils should ask for classroom teaching because they have the knowledge, that a gap – the lack of theory – has to be filled. If the educational process has reached this level, this would be the best effectivity of teaching and learning at the same time.

Reasons to learn

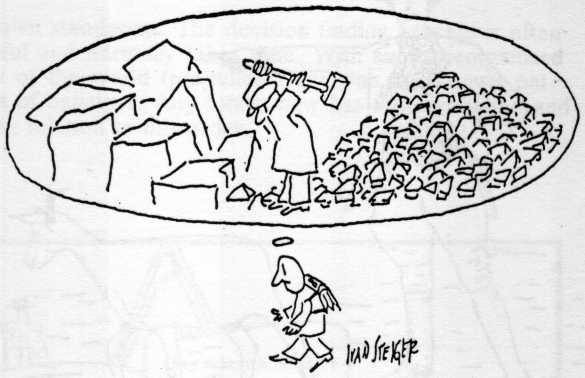
The learning human wants to reach a goal. This goals can be divided into different classes. They have a diffe-rent weight for the learning, but for the society too. If you try a rough classification you will get:

Learning for you own advantage.
Learning, to posses the contents of learning, the stuff.
Learning to reach a superior goal, which cannot be reached without certain knowledge.
Learning for a task to be fulfilled.
Learning to impress anybody.
Learning to impose a loved other.
Learning to be as good as others.
Learning to get a reward.
Learning to avoid disadvantages.
Learning from fear because of punishment.
Learning under pressings.

By ordering this motives you get two major concepts. Leaning to reach something or learning to avoid some-thing. The task to reach a goal is emotionally from higher value to the human, than the negative one. So we could expect less problems on the positive way.

The educator has to pack his goals in a form, that the learning could identify with them. He needs additional positive formulations, to optimize the efficiency of the process.

The goals for learning are direct primary goals, this will mean the learning human wants to get the goal itself. Or they are secondary goals, this will mean that you want to reach a goal and need the knowledge to be learned for



this process. Those secondary goals have more relation for the positive motivation technics. The attractiveness of a goal does not loose it's attractiveness while working hard to get the steps to get there. This is so, even if the learning stuff is wearisome and the learning process is painful. The good feeling of the result pays for all troubles on the way. Remember the mountains climber. For a view from on top of the mountain and the possibi-lity to be proud on the own effort, he will take a lot of pains and risks on the way.

Educators have to pack the learning stuff into attractive situations and into interesting goals. The possibility to get the teaching result while playing, has the best effectivity and effort. This makes it easy, to motivate the others.

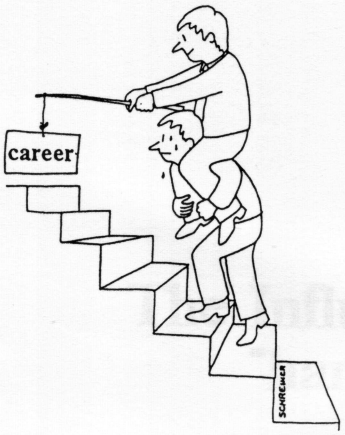
A lot of nowadays computer games do it just in the same mode. If you learn the basic rules of mathematics or physics playing games, this increases your knowledge just besides the fun effect. We have to learn, the using of those technics for most subjects of teaching. Else we have no chance to train the people of the third world and in the less developed countries. For the needed lifelong education, the preparation of new knowledge into games and entertainment is the precondition of being adapted voluntarily.

Necessity of "hands on" programs

Human beings are different. Therefore the methods to generate knowledge have to be different. The method has to be adapted to the receiver. In the last 50 years it was understood, that the top quality ideas are produced from humans which do not only come from top educated people of the old humanistic educational system. The theoretical educational process does neither grant the top quality of the educated, nor does it grant, that those people have the most progressive ideas later in their professional life. The possessors of the good ideas often are humans besides the socially emphasized situations and often besides the society itself. As a result of this understanding, a dual system of education is generally introduced in the most developed countries. The dualists consists of a theoretical and a practical way of training, to reach grades of higher education. In some countries the practical way is called the second way of education. Which shoves the valuation from the standpoint of those, who have served the first way as a traditional way.

But in the reality the theoretical way without any conditioning under practical boundaries, does not train to master real life's situations. Goethe already said: "grey, my friend, remains all theory" The need for relation, of the knowledge of facts to their applicability, is forcing. Even in the theoretical science of mathematics the "grey" theory remains not useful if you do not take in account the boundary conditions. Engineering without knowledge of the doing remains very ineffective.

From this knowledge the propagation of "hands on" education in the developed countries becomes more and more interesting. "Hands on" means that people have to understand the theory by doing. The experience of success and failing is elementary. It has to be made personally and has it's results in a modified behavior of the experienced person. Experiences remain in memory, without any additional memorizing tools. A side effect of the experience with own faults, while doing as long as there is success, gives knowledge that skill has to be trained. Facts have to be learned and faults are good for the knowledge that there is not enough training yet, and for nothing else. This personal experience gives the persons possibilities of free handling own errors and faulty situations. The fear from the new goes lost under this training conditions.



It seems to be important, that this methods of training in "hands on" programs, start in an early age. The loss of natural approach to the unknown, which happens during educational process, could be slowed down by using technics for handling own faults even in case of not succeeding in a proposed task. The influence of being included in social structures – which happens more and more with the ongoing educational process – results in the loss of the standpoint of innocence, the child has naturally. Being tied to the judgement of others, makes at the same time dependent from their meaning. If the young human did not learn, that nobody is perfect and it is no pity to make a fault the first time, there remain long lasting obstructions in his personal development.

The educators have to teach, that it is no pity to be ignorant – because that is normal human fate from the beginning of life – but it's a pity to remain ignorant. One of the results of learning fault management in an early age is, that the inevitable faults in human behavior become not more than a reason to find a way out of this situation. This is necessarily connected to a learning process, which cannot be introduced without "hands on" technics.

"Hands on" education creates a suitable surrounding for developing the personality on behalf of learning the own and natural limitations of any subject to be taken into account. It is easy to understand this facts in a simple subject, which can be made from unskilled people while doing it – or better – by manufacturing it in the basic sense of the word. This, instead getting the same experience in a complicated project, with parts of information processes and other conditions which do not depend from own skill and knowledge. The mental process is in both cases the same, but the educational subject just had been selected under the points of view, where there is no excuse for the failing by reason of others possible. In the real world in most cases we try to suppress the influence of the natural limits and of our personal limits while judging a situation. For the learning process the subjects have to be included in survisuable competences and responsibilities. Because the technic of scapegoat is alive in anyone of us. To avoid this wrong behavior, the training of "hands on" education is useful training.

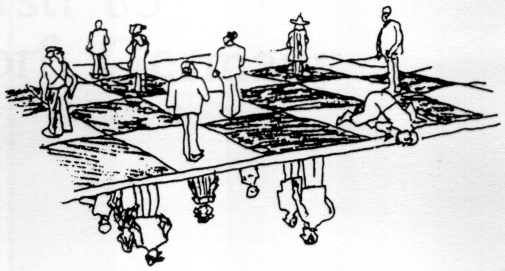
Conclusions

In most cases, the possibilities of the educators to use "hands on" education is not utilized. The "hands on" education helps to motivate the learning people. Subjects which can be learned by the use of this type of education, are worse to teach under other circumstances. The effectivity of the learning process increases by motivation.

Most people have a lot of natural mental installations for learning in relaxed surrounding as heritage of the education in the family. The more schematic technic of our schools does not use this heritage. The major reason therefore is the fact, that teachers are not educated to prepare the learning stuff for that methods. In many cases they believe, that this preparation makes more effort. But – arguing so – they do not count the effort of their usual teaching process by working with frustrated pupils and they do not count the effectivity of the educational process.

Assuming that in the future the pupils will be grown ups, because they follow the need for lifelong learning, the use of motivation as educator's tool is forcing.

The fact, that subject of motivation should not be the subjects to be learned (secondary way), is known. It is under such circumstances easy to increase effectivity and speed of the learning process. "Hands on" education gives just in this case a lot of more possibilities to hide the learning process than other methods. The personal desire, to finish an own job successfully, does not only transfer motivation, it gives additional a situation to learn the handling of faults and errors. Therefore this technics should be used in the educational process of teaching of all technical stuff.



world has excluding polarity

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